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REMARKS

Applicant respectfully requests that this amendment be entered and the rejections of the claims be reconsidered in light of the following remarks. The requested amendments to the claims are directed to matters of clarity and place the claims in condition for allowance or appeal. Other than deletion of a comma in claim 112, no changes are requested to the independent claims and the amendments do not necessitate a new search.

To recap the status of the claims: claims 112-118 and 120-143 were previously pending in this application. Claims 112, 117, 134, 135, 137, 138 and 139 have been amended. No new claims have been added. As a result, claims 112-118 and 120-143 are pending for examination with claims 112, 133 and 140 being independent claims. No new matter has been added.

Summary of Interview

Applicants thank the Examiner for the courtesy of an interview on September 7, 2005. During the interview, the claims were discussed in connection with the Koch et al., Senoh, and Girod et al. references. The following remarks may further serve as a summary of the interview.

Claim Rejections under 35 U.S.C. §112

Claims 117-118, 120-121, 134-139 and 143 are rejected under 35 U.S.C. §112, second paragraph.

The amendments to the claims should remove the rejections under 35 U.S.C. §112. Specifically, claim 117 has been amended to remove the term "time/frequency," found to be objectionable by the Examiner. In addition, a phrase has been deleted, which results in a clearer statement of the coverage of the claim. Claims 134, 135 and 137-139 were amended to address an obvious error noted by the Examiner.

Claims 118, 120-121 and 143 were not amended, but the rejection of these claims should be removed by changes to claim 117.

Claim 136 was not amended, but the rejection of this claim should be removed by the change to claim 134.

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Rejections under 35 U.S.C. §101

Claims 133-139 are rejected under 35 U.S.C. §101, as reciting non-statutory subject matter. During the interview, the Examiner indicated the basis for the rejection is that the claims recite "nonfunctional descriptive material."

Applicants respectfully disagree that claims 133-139 recite nonfunctional descriptive material. Each of these claims recites a computer-readable media that is encoded with "data that is watermarked with an identification code." The watermark and identification code are functional – they are important components contributing to the functioning of a system as described in the application. Further, the claims recite "a plurality of locations" and a "different modulation scheme at each of the plurality of locations" – which are limitations on where and how the data is stored. In summary, the claims recite structural and functional interrelationships rather than nonfunctional descriptive material. These claims are in the form approved by the Federal Circuit in *In re Lowry*, 32 F.3d 1579, 32 USPQ2d 1031 (Fed.Cir. 1994) and should be allowed.

During the interview, the Examiner indicated that the claims are rejected under the principle stated in *In re Warmerdam*, 33 F.3d 1354, 1360, 31 USPQ 2d 1754, 1759 (Fed.Cir. 1994). Applicants respectfully disagree that *In re Warmerdam* states the applicable legal principle. Both *In re Lowry* and *In re Warmerdam* are discussed at M.P.E.P. §2106 IV.B.1. Applicants acknowledge that the first paragraph of §2106 IV.B.1.(a) begins with an indication that data structures not claimed as embodied in computer-readable media are not statutory. But, that paragraph ends with an express statement that: "a claimed computer readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, *and is thus statutory.*" (Emphasis added.) The claims in the present application are directed to a "computer-readable medium" containing data with structural and functional properties and therefore is statutory.

Accordingly, the rejection should be withdrawn.

Rejections under 35 U.S.C. §103

Each of the independent claims, 112, 133 and 140, is rejected based on Koch et al., in view of Senoh and further in view of Girod et al. The Examiner acknowledges that Koch et al

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does not show "randomly selecting a plurality of number to frequency modulation relationships" as recited in claim 112. However, Examiner asserts that Senoh teaches this limitation and that one of skill in the art would have been motivated to combine the teaching of Senoh with the system described in Koch et al. based on the discussion in Senoh at column 4, lines 31-48.

The Examiner also acknowledges that the combination of Koch et al and Senoh does not teach frequency modulating at least a portion of the title data at each of the plurality of placement locations with a modulation derived by applying one of the plurality of number of frequency modulation relationships to the identification data. However, the Examiner cites Girod et al. as teaching this limitation and suggests that one of skill in the art would have been motivated to incorporate such a feature in a system as described by Koch et al. and Senoh by the teaching of Girod et al. that pre-compressed data can be watermarked.

Applicants respectfully disagree that the teachings of these references, if combined, would result in any of the claimed methods or structure. Senoh and Girod et al. merely duplicate the teachings of Koch et al. The references, even if combined, do not teach the elements of the claims that are not shown by Koch et al.

Koch et al. describes a method of watermarking that involves two components. As described in that reference, the first component produces a code and a random sequence of locations for embedding the code in the image. (See, page 2, col. 2, lines 48-50). The second component actually embeds the code at the specified locations. The second component is described to consist of four steps. (See, page 3, col. 1). In steps 1 and 2, the image data at the locations where the code is to be embedded is transformed. The specific transform used is not expressly mentioned in that passage, but a Discrete Cosine Transform (DCT) is mentioned later in the article. In step 3, the code is superimposed (*i.e., added*) on the signal $n(k,l)$, which is described in step 2 to be produced from the transformed image. In step 4, the signal is inversely transformed to produce the labeled image data.

The Examiner acknowledges that Koch et al. does not show randomly selecting a plurality of number to frequency modulation relationships. In fact, Koch does not show frequency modulating the title data at all. The code is merely added to a transformed representation of the title data.

Neither Senoh nor Girod et al. teaches the limitations of the claims not shown in Koch et al. Both of these references relate to performing what Koch et al. describes to be the second

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component of a watermarking method. Each of the references asserts to have improved the second component, but neither describes frequency modulating the title data in general or the more specific limitations of the claims, such as a plurality of number to frequency modulation relationships.

Senoh follows the same basic method described in Koch et al. As shown in FIG. 1 of Senoh, the signal to be watermarked is first transformed (*see*, Transform Section 1). In this reference, a wavelet transform is described in connection with a preferred embodiment, but other possible transforms are listed, including the Discrete Cosine Transform (*see*, e.g., col. 10, lines 34-39). Then, watermark data is *added* to the transformed signal (*see*, Weighting/Addition Section 23). Following addition of watermark data, the signal with embedded watermark data is produced by an inverse transform (*see*, Inverse Transform Section 3).

Specifically, Senoh describes at column 1, lines 37-40 that prior art watermarking methods using this same basic approach produced a uniformly spread spectrum, *i.e.*, white noise. The reference describes an approach in which the resulting signal has a "pink noise-like pattern" that makes the watermark data more difficult to detect in an image. (Column 7, lines 16-19). A "pink noise-like pattern" results because the distribution of the pseudo-random numbers generated in Pseudo-Random Number Generation Section 21 and the weighting of watermark data before it is added to the transformed signal differ from the prior art. However, Senoh shows the same basic approach of transforming the signal, adding watermark data and then performing an inverse transform to spread the watermark signal over the frequency spectrum of the signal. Therefore, this reference is similar to Koch and does not teach the components of the claimed invention that are not shown by Koch et al.

Girod et al. is also similar. As described in the Background section of Girod et al., this reference is addressed to overcoming two limitations of prior watermarking methods. As indicated by the Summary, the method described in Girod et al. allows the watermarking of compressed digital video bit streams (column 1, line 64). Girod et al. also provides a method for watermarking that does not increase the bit rate of the signal (column 2, lines 35-36). The method described in Girod involves transform coding the watermark signal in the same manner that the signal to be watermarked is transform coded (column 1, line 67 – column 2, line 2). Despite the pre-processing of the watermark signal, it is nonetheless *added* to the coefficients of

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a transformed video signal (see, column 2, line 6, and summing node 38 in FIGS. 2, 2A and 3) in much the same way that Koch et al. describes.

Because all of the cited references describe *adding* the watermark data to a transformed signal, none shows frequency modulating the title data as claimed. Nor do the references show or suggest "a plurality of number to frequency modulation relationships" as recited in claim 112 or "a different modulation scheme at each of the plurality of locations" as recited in claim 133 or "frequency modulation information associated with each position" as recited in claim 140. Thus, all of the independent claims should be allowed. The remaining claims, because they depend, directly or indirectly, from these claims, should also be allowed.

The limitations recited in the dependent claims further distinguish over the references. For example, claims 113 and 114 recite a watermarking key that is generated using an identifier of the randomly selected plurality of number to frequency modulation relationships. The Examiner cites the Mizikovsky reference to show that security keys were known. But, the reference does not teach security keys with the properties as claimed.

Other dependent claims, such as claim 117, also serve to highlight differences between the claimed invention and the references. Claim 117 recites that "the step of selecting a plurality of placement locations includes scanning the audio title data to determine a plurality of locations where a frequency deviation between channels of the audio title data is less than a predetermined frequency deviation or the frequency modulation of the audio title data is not discernible to a human ear." Applicants disagree that Koch et al. or any of the references teaches that selecting a plurality of placement locations includes scanning the audio title data to identify locations. In fact, Koch et al. takes an opposite approach, teaching as its first component the random selection of locations. By scanning the audio title data as part of selecting a plurality of placement locations, the selection of placement locations ceases to be completely random.

Though the selection of placement locations as recited in claim 117 results in a less random selection, it provides an advantage of reducing the chances that watermarked data will produce a human perceptible impact on the data. Because the claimed method involves a plurality of number to frequency modulation relationships, the loss of randomness in selecting placement locations as recited in claim 117 does not cause an unacceptable decrease in the security of the watermark.

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Other dependent claims provide further distinguishing features, some of which are listed in response to the prior Office Action and are not repeated here.

CONCLUSION

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Respectfully submitted,
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